

We claim:

1. A fiber tail assembly for connecting an optical fiber to an optical device, comprising:
 - an outer sleeve having a front end for connection to an optical device and a back end;
 - a sealing ferrule located in the outer sleeve, the sealing ferrule including a substantially axial bore;
 - a ferrule seal for hermetically sealing the sealing ferrule to the outer sleeve;
 - an optical fiber that extends from a back end of the sealing ferrule, through the bore, and protrudes out of a front end of the sealing ferrule; and
 - a fiber seal for hermetically sealing the optical fiber to the sealing ferrule.
2. The fiber tail assembly according to claim 1, further comprising a first stress relief tube located in the outer sleeve and having a back end that protrudes from the back end of the outer housing, the fiber passing through the first stress relief tube, and the first stress relief tube, the outer sleeve, and the fiber being secured together.
3. The fiber tail assembly according to claim 2, further comprising a spacer tube located in the outer sleeve between the sealing ferrule and the first stress relief tube, the fiber passing through the spacer tube, and the first stress relief tube, the spacer tube, the outer sleeve, and the fiber being secured together.
4. The fiber tail assembly according to claim 3, further comprising a second stress relief tube located in the first stress relief tube and protruding from the back end of the first stress relief tube, the fiber passing through the second stress relief tube, and the first stress relief tube, the second stress relief tube, the spacer tube, the outer sleeve, and the fiber being secured together.
5. The fiber tail assembly according to claim 1, further comprising a cap ferrule that has a front and back end and is located in the outer sleeve at the back end of the outer

sleeve, the cap ferrule having a substantially axial bore, the optical fiber passing through the bore of the cap ferrule, and the cap ferrule, the outer sleeve, and the fiber being secured together.

6. The fiber tail assembly according to claim 5, further comprising:
a length of optical fiber having a stripped length at a front end and an unstripped length behind, the stripped length being stripped of its buffer;
a front section of the cap ferrule at its front end having a front bore diameter, the front bore diameter being sized to provide a sliding fit to the stripped length of optical fiber;
a back section of the cap ferrule at its back end having a back bore diameter, the back bore diameter being sized to accommodate insertion of a part of the unstripped length of optical fiber;
an unstripped length of the fiber that has a buffer; and
a stripped length of the fiber that has been stripped of the buffer, the fiber passing through the cap ferrule so that the unstripped length lies in the back section and the stripped length passes through the front section, the bore of the cap ferrule in the back section being sized to accommodate the diameter of the unstripped length.
7. The fiber tail assembly according to claim 6, further comprising a spacer tube, the unstripped length passing through the spacer tube, the bore of the cap ferrule in the back section being sized to accommodate the diameter of the spacer tube, the spacer tube lying in the back section of and protruding from the back end of the cap ferrule, and the unstripped length, the spacer tube and the back section being secured together.
8. The fiber tail assembly according to claim 1, wherein the sealing ferrule is comprised of ceramic or glass.
9. The fiber tail assembly according to claim 1, wherein the ferrule seal is comprised of solder or glass.

10. The fiber tail assembly according to claim 1, wherein the fiber seal is comprised of glass.
11. The fiber tail assembly according to claim 1, wherein, wherein the optical fiber is polarization maintaining fiber.
12. The fiber tail assembly according to claim 5, wherein the cap ferrule is comprised of ceramic or glass.
13. A method of providing a fiber tail assembly for connecting an optical fiber to an optical device, the method comprising:
stripping a length of optical fiber of its buffer layer so as to form a stripped length at a front end and an unstripped length behind;
inserting a front end of a sealing ferrule into a back end of an outer sleeve, the sealing ferrule having an opposite back end and a substantially axial bore;
hermetically sealing the sealing ferrule to the outer sleeve with a ferrule seal;
inserting the stripped length of optical fiber into the bore at the back end of the sealing ferrule and advancing the fiber so that a portion of the stripped length protrudes out of the front end of the sealing ferrule and a part of the unstripped length lies in the back end of the outer sleeve;
securing together the back end of the sealing ferrule, a portion of the stripped length, and the interior of the outer sleeve; and
hermetically sealing the front end of the sealing ferrule to a portion of the stripped length protruding from the front end of the sealing ferrule.
14. The method according to claim 13, further comprising:
inserting the optical fiber through a first stress relief tube so that the first stress relief tube covers part of the unstripped length;
inserting the first stress relief tube into the back end of the outer sleeve so that part of the first stress relief tube protrudes out of the back end of the outer sleeve; and

securing together the unstripped length, the first stress relief tube, and the outer sleeve.

15. The method according to claim 14, further comprising:

inserting the optical fiber through a spacer tube so that the spacer tube covers part of the unstripped length;

inserting the spacer tube into the back end of the outer sleeve so that the spacer tube lies inside the outer sleeve between the first stress relief tube and the sealing ferrule; and

securing together the unstripped length, the spacer tube, the first stress relief tube, and the outer sleeve.

16. The method according to claim 15, further comprising:

inserting the optical fiber and first stress relief tube through a second stress relief tube so that the second stress relief tube covers part of the first stress relief tube;

inserting the second stress relief tube into the back end of the outer sleeve so that part of the second stress relief tube protrudes out of the back end of the outer sleeve; and

securing together the unstripped length, the spacer tube, the first stress relief tube, the second stress relief tube, and the outer sleeve.

17. The method according to claim 13, further comprising:

providing a cap ferrule, the cap ferrule including front and back ends and a substantially axial bore;

inserting the stripped length of optical fiber into the bore at the back end of the cap ferrule so that a front edge of the unstripped length is substantially advanced to the back end of the bore;

inserting the front end of the cap ferrule into the back end of the outer sleeve so that a part of the stripped length protrudes out of the front end of the sealing ferrule and a part of the cap ferrule protrudes out of the back end of the outer sleeve; and

securing together the cap ferrule and the outer sleeve.

18. The method according to claim 17, wherein the cap ferrule includes a front section with a front bore diameter and a back section with a back bore diameter, the front bore diameter being sized to provide a sliding fit to the stripped length of optical fiber, the back bore diameter being sized to accommodate insertion of a part of the unstripped length of optical fiber; and the method further comprising:

inserting the stripped length of optical fiber into the back end of the cap ferrule and advancing the fiber so that the front edge of the unstripped length is substantially advanced to the front end of the back section.

19. The method according to claim 18, further comprising:

inserting the optical fiber through a spacer tube so that a front edge of the spacer tube is substantially at the front edge of the unstripped length;

securing the unstripped length to the spacer tube; and

inserting the stripped length of optical fiber into the back end of the cap ferrule and advancing the fiber so that the front edges of the unstripped length and the spacer tube are substantially advanced to the front end of the back section.

20. The method according to claim 13, wherein the sealing ferrule is comprised of ceramic or glass.

21. The method according to claim 13, wherein the ferrule seal is comprised of solder or glass.

22. The method according to claim 13, wherein the fiber seal is comprised of glass.

23. The method according to claim 13, wherein the optical fiber is polarization maintaining fiber.

24. The method according to claim 17, wherein the cap ferrule is comprised of ceramic or glass.